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NASA Procedural Requirements

COMPLIANCE IS MANDATORY**NPR 8570.1**Effective Date: March 15,
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Request Notification of Change

 (NASA Only)

Subject: Energy Efficiency and Water Conservation w/Change 2 (4/04/08) REVALIDATED

Responsible Office: Environmental Management Division

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CHAPTER 8. Water Conservation

8.1 Introduction

Water conservation is the planned management of water to prevent exploitation, destruction, or neglect of water resources. Water conservation management is a relatively new science that incorporates audits of resources and uses of water, water-saving solutions, installation of water-saving solutions, and verification of water-cost savings.

19 This paragraph discusses water conservation, its relation to energy conservation, and its effects as seen from different perspectives. It also describes different types of water conservation measures and outlines the six steps involved in assembling an integrated and cost-effective water conservation program.

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8.3 Water Conservation Requirements

8.3.1 The DOE established Federal water conservation goals under the authority of Executive Order 13123. The goals require Federal agencies to reduce potable water usage by implementing cost-effective water efficiency programs that include a water management plan and not less than four of ten separate water efficiency improvement Best Management Practices (BMP). The ten BMPs are listed below and described in Appendix V:

- a. BMP # 1 - Public Information and Education Programs
- b. BMP # 2 - Distribution System Audits, Leak Detection & Repair
- c. BMP # 3 - Water Efficient Landscape
- d. BMP # 4 - Toilets and Urinals
- e. BMP # 5 - Faucets and Showerheads
- f. BMP # 6 - Boiler/Steam Systems

- g. BMP # 7 - Single-Pass Cooling Systems
- h. BMP # 8 - Cooling Tower Systems
- i. BMP # 9 - Miscellaneous High Water-Using Processes
- j. BMP #10 - Water Reuse and Recycling

8.3.2 BMPs are considered implemented at a facility when all the following criteria are met:

- a. Water management plans have been developed or revised and incorporated into existing facility planning processes and operating plans. Center water management plans should be incorporated into the Center Energy Efficiency and Water Conservation 5-Year Plans described in paragraph 3.2.
- b. Applicable O&M options have been put into practice, and retrofit/replacement options have been reviewed within the last 2 years and those appropriate for implementation have been identified.
- c. Applicable cost-effective retrofit/replacement options have been implemented.

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8.6.4.2 Reserved.

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8.7.2.16 Reserved.

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8.7.3.1 Reserved.

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8.7.3.3 Reserved.

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8.9 Water Conservation Program

8.9.1 General. This paragraph describes a step-by-step approach for designing a water conservation program.

8.9.2 Provide for User/Occupant Involvement. Personnel who will be affected by a water conservation measure need to accept the measure in order for it to be successful. It is essential that personnel have the opportunity to be involved in the measure's screening and assessment. Information on personnel acceptance may be available from other Centers that have implemented similar measures. If not, collect input directly from the affected personnel through personal or group interviews. Provide as much information as possible to the participants about the proposed measures and estimated water and energy savings. With the participant's feedback, the design of the proposed measure can be refined to improve acceptance.

8.9.3 Research Regulatory Requirements. State and local conservation regulations may be more stringent than federal regulations, especially in drought-prone areas. In these areas, it may be good public relations to be seen by the public as a partner rather than an adversary. This could mean adhering to local water conservation regulations even if federal facilities are not required to do so.

8.9.4 Establish Conservation Goals. EPACT does not specify water conservation goals. It only requires that all cost-effective water conservation measures be implemented. "Cost-effective" is defined as any measure with a payback period of less than 10 years. Federal water conservation goals established by DOE in response to Executive Order 13123 are based on implementing appropriate BMPs. Center-specific water usage reduction goals may be adopted, if deemed beneficial to the water management program.

8.9.5 Select BMPs for Implementation.

8.9.5.1 Select BMPs that are Applicable, Feasible, and Acceptable. Based on type of end use, determine which BMPs are appropriate to the end use and the physical characteristics of the site. Determine which are initially feasible by the benefit/cost analysis and ensure that the BMPs will be acceptable to Center management.

8.9.5.2 Select Measures with Acceptable Noneconomic Impacts. In addition to the economic impacts of water savings, a water conservation measure may have a number of noneconomic impacts. These impacts may include environmental, social, and others relating to the water user. A number of methods can be used for "ranking" impacts in the evaluation. Use a simple and uniform ranking system for the entire evaluation to help identify feasible and

nonfeasible alternatives. This system is also referred to as a "qualitative evaluation." One approach to a qualitative evaluation is to make a comprehensive list describing each of the impacts. Next, determine whether the impact is positive, negative, or neutral. This type of assessment might reveal the positive environmental impacts of an economically nonfeasible conservation measure. Those positive noneconomic impacts may be considered significant enough to make an economically borderline project successful.

8.9.5.3 Determine the Conservation Potential of Selected BMPs. The last step before estimating the economic benefits and costs of each BMP is to determine its water and energy conservation potential. This determination involves comparing end use water consumption without the BMP (the status quo) with the expected water use after the BMP is implemented. The conservation potential figure can be determined for any period of time. Once a conservation potential figure is calculated, it can be further extrapolated by the number of fixtures and operating time.

8.9.6 Estimate Benefits and Costs. The life-cycle costing methods and procedures delineated in 10 CFR Part 436, described in paragraph 4.9, should be used to determine the cost-effectiveness of implementing potential BMPs.

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